

Host group 266 defines a policy for multiple hosts 270, 272, 274. A new threshold value 268 is defined that overrides the predefined default threshold value 244. This results in host3 270, host4 272, and host5 274, inheriting the new threshold value attribute 268. However, all other
5 attributes will be inherited from the default list 244 as defined in the SAN domain level 242. Specifically, the multiple hosts 270, 272, 274 associated with the host group 266 have the following attributes in their policy definition: monitor flag (on), extend flag (on), threshold value (85%), LUN group (any), extension minimum size (1GB), extension maximum size (10GB), max file system size (30GB), and alert interval (1 day).

10 The host 276 is not included in a host group 266, 246, and therefore inherits all the predefined attributes 244 from the SAN domain 242, except for those explicitly set. In this instance, the host 276 has explicitly set attribute values for a threshold value 278, LUN group 280, and max file system size 282.

15 In the illustrated embodiment, the policy hierarchy is represented by a hierarchy of object oriented programming (OOP) objects or other in runtime data structures. It is likewise persisted to a database (not shown), e.g., in the manner described above in connection with FIGURE 13. In operation, the manager 20 access these runtime data structures and/or database to discern a
20 policy for file system extension, e.g., in connection with the processing sequence described above in connection with FIGURE 7A.

Display and Management of File System Extension Policy Hierarchy

As discussed above, the SAN manager (FIGURE 15, item 20) provides a graphical user interface (GUI) to display components of the SAN topology, such as, the hosts, the storage devices, along with their interconnections and attributes. Particularly, as an example of a GUI utilized by the SAN manager 20 of the invention, FIGURE 16 illustrates a display 100 in a portion of which a storage device, and its selected attributes (e.g., serial number, product Id) are shown. The storage device is identified in a first panel, while its selected attributes are displayed in a second panel that is vertically separated from the first. Selection of the storage device in the first panel (by clicking on the icon representing the storage device) results in the display of its properties in the second panel.

Continuing the discussion from the section entitled "File System Extension Based On A Hierarchical Policy Having Attribute Inheritance," the manager 20, using for example the interface illustrated in FIGURE 15 and/or the NetView interface functionality shown in FIGURE 6, provides a graphical user interface (GUI) on which the policy hierarchy is displayed and through which the policy attributes can be set or modified by the operator/administrator. The manager 20 generates the display so as to present the policy hierarchy and corresponding attributes in a first panel, while presenting list controls, dialog boxes or other editable fields for each policy and attribute value in a second panel (e.g., separated vertically from the first panel). As fields of the second panel are modified by the operator/administrator, those modifications are immediately presented in a refreshed hierarchical policy view on the first panel. In the illustrated

embodiment, the manager maintains a constant display of policy attributes values at each level in the hierarchy, making the policy visible for all levels simultaneously.

FIGURE 34 illustrates a GUI generated by manager 20 for purposes of display and management of a policy hierarchy 284 in accordance with an embodiment of the present invention. The display 284 is separated into two vertical panels 286, 288, though will be appreciated that other screen arrangements may be utilized (e.g., horizontal panels, cascading panels, and so forth).

In the first panel 286, the manager 20 presents a hierarchical graphic 290 (in this case, in tree form – though other forms can be used instead or in addition) that represents the entire policy hierarchy for the SAN and the attribute values for each policy level. To avoid clutter, only override values are shown at each level, except for the domain level where all values are effectively “overrides.” Thus, for example, branch 291 depicts all policy attributes at the domain level, while branch 292 depicts only the override values for Host Group A host group policy level (with items 294, 296, and 298 specifying the specific overrides for that group). For convenience, levels for which all values are inherited can be marked with a designator such as “(All properties inherited).”

The second panel 288 presents a plurality of editable fields 300 for all policy attributes for a policy level selected in the first panel, in this case policy 292. Through edit fields 300, the manager 20 permits the operator/administrator to modify the policies and inherited attribute values 290. Modifications made in any of the editable fields 300 in the second panel 288, are immediately represented in a refreshed view of the hierarchical policy structure 290 in the first